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EXAMINER

ABRAHAM, ESAW T

ART UNIT	PAPER NUMBER
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2112

NOTIFICATION DATE	DELIVERY MODE
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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/543,005	Applicant(s) WATANABE ET AL.	
	Examiner ESAW T. ABRAHAM	Art Unit 2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30,31,36-38,43-46,51-54 and 59-64 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30,31,36-38,43-46,51-54 and 59-64 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The reply filed on November 24, 2008, has been received and entered.
Claims 31, 31, 36-38, 43-46, 51-54, and 59-63 remain pending.
Claim 64 is added.

Response to Arguments

2. Applicant's arguments filed November 24, 2008, have been fully considered but they are not persuasive. Further, a new ground(s) of rejections under 35 USC 112 is and under 35 USC 101, non-statutory made.

As to the references not teaching the limitation “predetermined order relationship is determined by the order of magnitude of resolution of the rational number”, this is not relevant as this feature is not detailed in the claim language. The interpretation of the claim language must be as broad as possible for the given art. If the Applicant needs a specific interpretation of the claim language, these details must be imported into the claims. These details cannot be read into the claim language when the claim language is so broad as to encompass other valid interpretations. Without further detail as to what is meant by this limitation or how this limitation is performed, this limitation is taught by the references.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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3. Claims 31, 31, 36-38, 43-46, 51-54, and 59-64 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

For example, claims 30, 31, 37, 38, 44, and 52 recite "predetermined order relationship is determined by the order of magnitude of resolution of the rational number". It is not clear what is meant by the order of magnitude of resolution and how it relates to the rational number. Further, it is not clear how the order of magnitude of resolution of the rational number affect the predetermined order relationship. For example, the predetermined order relationship could be determined only if the order of magnitude resolution of the rational number satisfies certain conditions, or the predetermined order relationship could be determined through other different means. Furthermore, the Examiner invites Applicants and/or Applicants' council to conduct an interview to clarify language that may be amenable to both the Examiner and the Applicants. Until and unless the language is clarified and understood, further examination on merits will be halted and the previous rejections are maintained for the all pending claims. See previous office action.

4. Claims 30, 31, 37, 38, 44, and 52 recite the limitation "the same layer" in line 2. There is insufficient antecedent basis for this limitation in the claim.

5. Claims 30, 31, 37, 38, 44, and 52 recite the limitation "the order of magnitude resolution" last line of the last paragraph. There is insufficient antecedent basis for this limitation in the claim.

6. Claim 64 recites the limitation "each rational number" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Dependent claims depend from claims 30, 31, 37, 38, 44, and 52 and therefore are rejected as well.

7. Claims 60 and 62 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

For example, claim 60 recites "a computer readable medium storing a program for causing a computer to function as the encoding device according to claim 30". It is not clear how the computer readable medium functions as the encoding device of claim 30? Since a computer readable medium (storage or recorder) and an encoder are two different components in a system made or used for different purposes, one for storing data or programs and the other one for encoding data. Claim 62 recites similar limitations and need attention as well.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 38 and 52-54 and 63 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non- statutory subject matter.

NON-STATUTORY SUBJECT MATTER

There can be no dispute that Applicants' claim would meet this definition of "process." But the Supreme Court has held that the meaning of "process" as used in § 101 is narrower than its ordinary meaning. See *Flook*, 437 U.S. at 588-89 ("The holding [in *Benson*] forecloses a purely literal reading of § 101."). Specifically, the Court has held that a claim is not a patent-eligible "process" if it claims "laws of nature, natural phenomena, [or] abstract ideas." *Diamond v. Diehr*, 450 U.S. 175, 185 (1981) (citing *Flook*, 437 U.S. at 589, and *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). Such fundamental principles⁵ are "part of the storehouse of knowledge of all men . . . free to all men and reserved exclusively to none." *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 130 (1948); see also *Le Roy v. Tatham*, 55 U.S. (14 How.) 156, 175

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(1852) ("A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right."). "Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work." Benson, 409 U.S. at 67; see also Comiskey, 499 F.3d at 1378-79 (holding that "mental processes," "processes of human thinking," and "systems that depend for their operation on human intelligence alone" are not patent-eligible subject matter under Benson).

A claimed process is surely patent-eligible under § 101 if: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing. See Benson, 409 U.S. at 70 ("Transformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines."); Diehr, 450 U.S. at 192 (holding that use of mathematical formula in process "transforming or reducing an article to a different state or thing" constitutes patent-eligible subject matter); see also Flook, 437 U.S. at 589 n.9 ("An argument can be made [that the Supreme] Court has only recognized a process as within the statutory definition when it either was tied to a particular apparatus or operated to change materials to a 'different state or thing'"); *Cochrane v. Deener*, 94 U.S. 780, 788 (1876) ("A process is . . . an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing.").

The claim at issue in *Flook*, in contrast, was directed to using a particular mathematical formula to calculate an "alarm limit"—a value that would indicate an abnormal condition during an unspecified chemical reaction. 437 U.S. at 586. The Court rejected the claim as drawn to the formula itself because the claim did not include any limitations specifying "how to select the appropriate margin of safety, the weighting factor, or any of the other variables . . . the chemical processes at work, the [mechanism for] monitoring of process variables, or the means of setting off an alarm or adjusting an alarm system." See *id.* at 586, 595. The claim thus was not limited to any particular chemical (or other) transformation; nor was it tied to any specific machine or apparatus for any of its process steps, such as the selection or monitoring of variables or the setting off or adjusting of the alarm.

A canvas of earlier Supreme Court cases reveals that the results of those decisions were also consistent with the machine-or-transformation test later articulated in *Benson* and reaffirmed in *Diehr*. See *Tilghman*, 102 U.S. at 729 (particular process of transforming fats into constituent compounds held patentable); *Cochrane*, 94 U.S. at 785-88 (process transforming grain meal into purified flour held patentable); *Morse*, 56 U.S. (15 How.) at 113 (process of using electromagnetism to print characters at a distance that was not transformative or tied to any particular apparatus held unpatentable). Interestingly, *Benson* presents a difficult case under its own test in that the claimed process operated on a machine, a digital computer, but was still held to be ineligible subject matter. However, in *Benson*, the limitations tying the process to a computer were not actually limiting because the fundamental principle at issue, a particular algorithm, had no utility other than operating on a digital computer. *Benson*, 409 U.S. at 71-72. Thus, the claim's tie to a digital computer did not reduce the pre-emptive footprint of the claim since all uses of the algorithm were still covered by the claim. The Supreme Court has held that

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mental processes, like fundamental principles, are excluded by § 101 because "[p]henomena of nature, though just discovered, mental processes, and abstract intellectual concepts . . . are the basic tools of scientific and technological work." *Comiskey*, 499 F.3d at 1377 (quoting *Benson*, 409 U.S. at 67) (emphasis added). And we actually applied the machine-or-transformation test to determine whether various claims at issue were drawn to patent-eligible subject matter.²⁴ *Id.* at 1379 ("Comiskey has conceded that these claims do not require a machine, and these claims evidently do not describe a process of manufacture or a process for the alteration of a composition of matter."). Because those claims failed the machine-or-transformation test, we held that they were drawn solely to a fundamental principle, the mental process of arbitrating a dispute, and were thus not patent-eligible under § 101. *Id.*

The machine-or-transformation test is a two-branched inquiry; an applicant may show that a process claim satisfies § 101 either by showing that his claim is tied to a particular machine, or by showing that his claim transforms an article. See *Benson*, 409 U.S. at 70. Certain considerations are applicable to analysis under either branch. First, as illustrated by *Benson* and discussed below, the use of a specific machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility. See *Benson*, 409 U.S. at 71-72. Second, the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity. See *Flook*, 437 U.S. at 590. Purported transformations or manipulations simply of public or private legal obligations or relationships, business risks, or other such abstractions cannot meet the test because they are not physical objects or substances, and they are not representative of physical objects or substances. The basis for this language in *State Street* and *Alappat* was that the Supreme Court has explained that "certain types of mathematical subject matter, standing alone, represent nothing more than abstract ideas until reduced to some type of practical application." *Alappat*, 33 F.3d at 1543; see also *State St.*, 149 F.3d at 1373.

Claims 38 and 52 recite a "method" comprising three steps. The claim, if statutory, falls within the statutory class of "process."

"A process is... an act, or a series of acts, performed upon the subject matter to be transformed and reduced to a different state or thing." *Cochrane v. Deener*, 94 U.S. 780, 788 (1877). "Transformation and reduction of an article 'to a different state or thing' is the clue to the patentability of a process claim that does not include particular machines." *Diamond v. Diehr*, 450 U.S. 175, 184 (1981) (quoting *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972)).

There are cases suggesting that the lack of transformation is not determinative with respect to whether a claimed process is statutory. Those cases, however, involved inventions that at least used *machines* to transform *data*. For example, the court reviewing in *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 1357 (Fed. Cir. 1999), set forth (citing *In re Alappat*, 33 F.3d 1526, 1544 (Fed. Cir. 1994) (en banc)) that a § 101 inquiry is directed to the determination of whether the claimed subject matter as a whole is a disembodied mathematical concept representing nothing more than a "law of nature" or an "abstract idea," or if the

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mathematical concept has been reduced to some practical application rendering it "useful." A claimed process that produces a useful, concrete, tangible result without pre-empting other uses of the mathematical principle falls within the scope of § 101. *AT&T Corp.* at 1358. The process held to be statutory in *AT&T Corp.*, however, required the use of switches and computers. *See, e.g., id.* at 1358 (AT&T's claimed process used "switching and recording mechanisms" to create a "signal" useful for billing purposes).

The "process" of instant claims 38 and 52 do not require any transformation and reduction of an article "to a different state or thing." Nor is the "process" tied to a particular machine that transforms data in such a way to produce a useful, concrete, and tangible result. Under a broad but reasonable interpretation of claims 38 and 52, the subject matter of the claim requires at most human thought and paperwork.

Claims 38 and 52 do not recite any particular way of implementing the steps.

Claims 38 and 52 do not require any machine or apparatus to perform the steps.

Claims 38 and 52 do not recite any electrical, chemical, or mechanical acts or results, which are typical in traditional process claims.

Claims 38 and 52 do not call for any physical transformation of an article to a different state or thing, nor does it require any transformation of data or signals.

Claims 38 and 52 represent mere abstraction; i.e., a disembodied mathematical concept representing nothing more than an "abstract idea," which has not been reduced to some practical application that renders it "useful." As the Supreme Court has made clear, "[a]n idea of itself is not patentable." *In re Warmerdam*, 33 F.3d 1354, 1360 (quoting *Rubber-Tip Pencil Co. v. Howard*, 87 U.S. (20 Wall.) 498, 507, 22 L.Ed. 410 (1874)).

Claims 53, 54 and 63 depend from claim 52 and inherently include limitations therein and therefore are rejected as well

9. Claims 61 and 63 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non- statutory subject matter.

For example, claims 61 and 63 "A computer-readable medium storing a program for causing a computer to perform the encoding method according to claim 37 (as in claim 61) and A computer-readable medium storing a program for causing a computer to perform the decoding method according to claim 52 (as in claim 63) are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

MPEP 2106 recites the following supporting rational for this reasoning:

"Descriptive material can be characterized as either "functional descriptive material" or

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"nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data. Both examples of "descriptive material" are nonstatutory when claimed as descriptive material per se. *Warmerdam*, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer- readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized."

In this case, applicants have merely claimed an abstract algorithm or disembodied program steps that are not embodied on a computer-readable medium and specifically employed as a computer component to be executed on a processor and perform the claimed limitations. Thus, Applicants have attempted to claim nonfunctional descriptive material.

An invention which is eligible for patenting under 35 U.S.C. 101 is in the useful arts when it is a machine, manufacture, process or composition of matter, which produces a concrete, tangible, and useful result. The fundamental test for patent eligibility is thus to determine whether the claimed invention produces a "useful, concrete and tangible result." The test for practical application as applied by the examiner involves the determination of the following factors: (1) Useful - The Supreme Court in *Diamond v. Diehr* requires that the examiner look at the claimed invention as a whole and compare any asserted utility with the claimed invention to determine whether the asserted utility is accomplished. Applying utility case law the examiner will note that: (a) the utility need not be expressly recited in the claims, rather it may be inferred. (b) if the utility is not asserted in the written description, then it must be well established.

Furthermore, although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). (2) Tangible - Applying *In re Warmerdam*, 33 F.3d 1354, 31 USPQ2d 1754 (Fed. Cir.

1994), the examiner will determine whether there is simply a mathematical construct claimed, such as a disembodied data structure and method of making it. If so, the claim involves no more than a manipulation of an abstract idea and therefore, is nonstatutory under 35 U.S.C. 101. In *Warmerdam* the abstract idea of a data structure became capable of producing a useful result when it was fixed in a tangible medium which enabled its functionality to be realized.

(3) Concrete - Another consideration is whether the invention produces a concrete result. Usually, this question arises when a result cannot be assured. An appropriate rejection under 35 U.S.C. 101 should be accompanied by a lack of enablement rejection, because the invention cannot operate as intended without undue experimentation.

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The Examiner respectfully submits, under current PTO practice, that the claimed invention does not recite a *tangible result*.

A claim that requires one or more acts to be performed defines a process. However, not all processes are statutory under 35 U.S.C. 101. *Schrader*, 22 F.3d at 296, 30 USPQ2d at 1460. To be statutory, a claimed computer-related process must either: (A) result in a physical transformation outside the computer for which a practical application in the technological arts is either disclosed in the specification or would have been known to a skilled artisan (discussed in i) below), or (B) be limited to a practical application within the technological arts (discussed in ii) below). See *Diamond v. Diehr*, 450 U.S. at 183-84, 209 USPQ at 6 (quoting *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1877)) ("A [statutory] process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thingThe process requires that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence. "). See also *Alappat*, 33 F.3d at 1543, 31 USPQ2d at 1556-57 (quoting *Diamond v. Diehr*, 450 U.S. at 192, 209 USPQ at 10). See also *id.* at 1569, 31 USPQ2d at 1578-79 (Newman, J., concurring) ("unpatentability of the principle does not defeat patentability of its practical applications") (citing *O'Reilly v. Morse*, 56 U.S. (15 How.) at 114-19). If a physical transformation occurs outside the computer, a disclosure that permits a skilled artisan to practice the claimed invention, i.e., to put it to a practical use, is sufficient. On the other hand, it is necessary for the claimed invention taken as a whole to produce a practical application if there is only a transformation of signals or data inside a computer or if a process merely manipulates concepts or converts one set of numbers into another.

As per claims 61 and 63, the claims are merely drawn to "a computer readable medium storing a program for causing a computer to function.....". There is no functionality carried out by the storage device with the computer **until the code is actually executed**. It should be noted that code (i.e., a program) **does not do anything per se. Instead, it is the code stored on a computer that, when executed, instructs the computer to perform various functions.**

The following claim is a generic example of a proper computer program product claim;

"A computer readable recording medium having stored or embodied thereon a computer program that, when executed performs the encoding method according to claim *."

Conclusion

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Esaw T. Abraham whose telephone number is (571) 272-3812.

The examiner can normally be reached on M-F 8am-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jacques Louis-Jacques can be reached on (571) 272-6962. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/EA/

02/02/09

/Esaw T Abraham/
Primary Examiner, Art Unit 2112